AI FOR NETWORKING

FAULT MANAGEMENT

- Fault management involves detection, isolation, and correction of an abnormal condition of a network.

USECASES – FAULT PREDICTION:

No	ML TECHNIQUE	DATASET	TASK (OUTPUT)
1	Supervised: NN (MLP)	Generated using discrete time event simulation	Dependability of a network · Survivability · Availability · Failed components · Reportable outages
2	Supervised: DT (J4.8) · Rule learners (JRip) · SVM · BN · Ensemble	Generated using sensor network testbed	Link quality estimation
3	Supervised: BN	Data collected from router	Predict network health
4	Supervised: BN	Simulation with fault injection	Faulty or not

USECASES – FAULT DETECTION:

No	ML TECHNIQUE	DATASET	TASK (OUTPUT)
1	A combination of NN (radial basis functions)	Simulation with OPNET	Detect one of the fault scenarios · Reduced switch capacity · Increased packet generation rate of a certain application · Disabled switch · Disabled links
2	Statistical learning	Data collected from real cellular network	Detect faults at · Base station level · Sector level · Carrier level · Channel level
3	Supervised: RNN	Collected from a simulated sensor network	Approximation of the output of the sensor node
4	Supervised: k-Means · FCM · EM	Obtained from a network with heavy and light traffic scenarios	Predict network health
5	Unsupervised change detection method	Collected from a real network using remote monitoring agents	An alarm as soon as an anomaly occurs

USECASES – FAULT LOCALIZATION:

No	ML TECHNIQUE	DATASET	TASK (OUTPUT)
1	BN	Synthetically generated time series	Detect one of the two fault scenarios · Tight filtering · Inter-channel interference
2	Supervised: DT (ID3)	Generated using small testbed platform	Hardware and software components that are correlated with the failures
3	BN and EMD	Synthetically generated from a simulated and a real UMTS network	Identify the cause of the fault